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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,056	12/31/2001	Byeong-Dae Choi	053785-5045	5637

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EXAMINER

WARREN, MATTHEW E

ART UNIT	PAPER NUMBER
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2815

MAIL DATE	DELIVERY MODE
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10/16/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/032,056	Applicant(s) CHOI, BYEONG-DAE	
	Examiner MATTHEW E. WARREN	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 16-29 is/are pending in the application.
- 4a) Of the above claim(s) 16-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to the Remarks filed on June 15, 2009.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant's Prior Art Figures 2 and 3F (APAF) in view of Kakuda et al. (US 5,162,933) and Seo et al. (US 5,825,437).

In re claim 1, APAF 2 and 3F show an array substrate for a liquid crystal display device, comprising a substrate (22) a plurality of gate lines (25) arranged transversely on the substrate; a plurality of data lines (27) disposed orthogonal to the plurality of gate lines. A plurality of thin film transistors is formed on the substrate adjacent to intersections of the gate lines and the data lines. Each thin film transistor includes a gate electrode (32), a gate insulation layer (41), an active layer (45), an ohmic contact layer (47), a source electrode (33), and a drain electrode (35), the source electrode extended from each of data lines and overlapping a portion of the gate electrode. A plurality of pixel electrodes (17) are disposed at pixel regions (P) defined by the intersections of the gate lines and the data lines wherein each pixel electrode connected to a corresponding one of the drain electrodes. A metal layer (28) is formed at

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peripheral portions of the drain electrode to extend from the pixel electrode. The source electrode is positioned between the ohmic contact layer and the metal layer. The APAF shows all of the elements of the claim except the metal layer formed on an entire surface of each of the data lines and the source electrode. Kakuda et al. shows (figs. 3 and 4) an LCD device having data line (11) with a metal layer formed on the entire surface. A source electrode (22) extends from the data line (col. 4, lines 50-53) and is also covered with a metal layer (11b in fig. 4). With such a configuration, the resistance of the data lines is reduced. (col. 7, lines 51-55). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the data line of the APAF by forming a metal layer on the entire data line as taught by Kakuda to reduce the resistance of the data lines.

The APAF and Kakuda show all of the elements of the claims except the metal layer formed on the entire surface of the source electrode. Seo et al. shows (fig. 8d, 8e) that a source side electrode (7 on the left side) has a metal layer (8) formed on its entire surface. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the metal layer of the APAF and Kakuda by forming the metal on the entire surface of the source electrode as taught by Seo because such a configuration is suitable for reducing the resistance of the source electrode.

In re claims 2 and 11, the APAF shows (fig. 3B) that the gate insulation layer (41) is disposed on the gate electrode or a plurality of gate electrodes as shown in figure 2.

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In re claim 3, the APAF shows (fig. 3B) that the active layer (45) is disposed on the gate insulation layer, and the ohmic contact layer (47) is disposed on the active layer.

In re claim 4, the APAF (fig. 3F) shows that the source electrode (33) and the drain electrode (35) are disposed on the ohmic contact layer.

In re claims 5 and 6, the APAF shows (fig. 2) that the source electrode extends from one of the data lines and the drain electrode extends from one of the pixel electrodes.

In re claim 7-10, the APAF discloses [0009] that the drain electrode and source electrode include at least a transparent conductive material (ITO). Each data line includes at least the transparent conductive material (ITO). Each pixel electrode (17) includes the transparent conductive material (ITO). The transparent conductive material is selected from a group including indium tin oxide, indium zinc oxide, zinc oxide, tin oxide, and indium oxide.

In re claim 12, Kakuda discloses (col. 7, lines 8-28) that the materials of the metal layer are selected from the group including Au, Ag, Cu, and Al.

In re claim 14, the APAF shows (fig. 3F) that the metal layer (28) is formed at peripheral portions of the plurality of pixel electrodes and at peripheral portions of the drain electrode.

Response to Arguments

Applicant's arguments filed with respect to claims 1-14 have been fully considered but are not persuasive. The applicant primarily asserts that the cited prior art references do not show all of the elements of the claims, specifically that Seo does not cure the deficiencies of the APAF and Kakuda. The examiner believes that Seo cures the deficiencies of the APAF and Kakuda and that the combined references show all of the elements of the claims. The applicant asserts in the Remarks that the layer (7) of Seo (fig. 8d) is not a source electrode because it is doped semiconductor layer. However, Seo discloses (col. 8, lines 1-20) that layers (6, 7, and 8) make up the source/drain regions of the device. It is well known in the art of semiconductors that source/drain electrodes are doped regions of silicon or polysilicon material. As disclosed in Seo (col. 8, lines 1-20) the metal layer is formed on the entire structure (including layer 7 which is the source and drain) and therefore satisfies the limitation of the claim. For these reasons, Seo cures the deficiencies of the APAF and Kakuda and the rejection is proper. Therefore, this action is made final.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW E. WARREN whose telephone number is (571)272-1737. The examiner can normally be reached on Mon-Thur and alternating Fri 9:00-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on (571) 272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew E Warren/
Primary Examiner, Art Unit 2815